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Subject: Fwd: CSB Uncovers Flaws at the DuPont Insecticide Plant in La Porte, Texas, Where Four Workers D
Date: Wednesday, September 30, 2015 2:10:15 PM

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Date: September 30, 2015 at 10:35:42 AM CDT
To: "enders.jhana@epa.gov" <enders.jhana@epa.gov>
Subject: CSB Uncovers Flaws at the DuPont Insecticide Plant in La Porte, Texas, Where Four Workers D
Reply-To: <news@csb.gov>

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Houston, Texas, September 30, 2015 -- An ongoing investigation by the U.S. Chemical Safety Board (CSB) of the November 15, 2014, toxic chemical leak that killed four workers at the E. I. du Pont de Nemours insecticide plant in La Porte, Texas, has uncovered flawed safety procedures, design problems and inadequate planning.

Nearly 24,000 pounds of deadly methyl mercaptan escaped in the middle of the night through two valves in a poorly ventilated manufacturing building. In one area of the plant, operations personnel attempted to clear blocked piping. Later in a different area, two workers opened valves in response to what they believed was a routine, unrelated pressure problem. The two workers were killed when liquid methyl mercaptan drained from the open valves, filling the room with toxic vapor. One of those workers made a distress call, and two additional workers died responding to that call.

The Board is poised to take up and vote on investigators' [draft findings and recommendations](#) at a public meeting on Wednesday night September 30 in Houston not far from the plant. The Board will also release [an animation](#) based on the team's findings showing how the fatal accident occurred. Those unable to attend the meeting may watch a live webcast at the following link:

[CSB DuPont La Porte Public Meeting Webcast](#)

CSB Chairperson Vanessa Allen Sutherland said, "DuPont has long been regarded as a safety leader in the chemical industry, but this investigation has uncovered weaknesses or failures in DuPont's safety planning and procedures. These interim recommendations lay out what the company at its La Porte facility should do to protect workers and the public."

Days prior to the accident, water had mixed with liquid methyl mercaptan in piping. Due to cold weather in the Houston area, this mixture formed a solid material called a hydrate, which blocked the piping. A DuPont technical team eventually developed a plan to clear the blockage by spraying hot water onto the pipes, melting the hydrate. On November 15, operations personnel worked through the night attempting to clear the blockage. Following a failed start-up, workers paused to take a break. But during that break, the plant started to experience a different problem -- high pressure in other piping.

DuPont had long-standing issues with vent piping to an incinerator installed in 2011. To deal with these problems, daily instructions had been provided to operations personnel to drain liquid from these pipes, which were located in another section of the plant. DuPont's instructions did not specify additional breathing protection for this task. On the night of the incident, not realizing the original blockage was cleared, workers went to drain the other piping. They did not know that high pressure in that other piping was related to the fact that liquid methyl mercaptan was once again flowing through the original, now unblocked pipes.

"Neither workers nor the public are protected by DuPont's toxic gas detection system," investigators said. The building where the workers died was not equipped with an adequate toxic gas detection system to alert workers to the presence of dangerous chemicals. Also, two rooftop ventilation fans were not working, despite an "urgent" work order written nearly a month earlier. However, investigators said even working fans probably would not have prevented a lethal atmosphere inside the building due to the large amount of toxic gas released.

The La Porte incident marks the third CSB investigation into a fatal accident at DuPont plants in the past five years. One worker was killed in 2010 when a steel hose carrying phosgene gas burst at a Belle, W.Va., plant. Later that year, a welder perished in an explosion at a Buffalo, N.Y., facility.

DuPont is one of the world's oldest and largest chemical manufacturers, tracing its history to a gunpowder mill on the banks of the Brandywine River in Delaware in 1802. DuPont made insecticides, herbicides, and other products in separate units at the facility in La Porte. Methyl mercaptan is a raw material of Lannate®, a top-selling, broad-spectrum insecticide. Production of insecticide has not yet resumed at the La Porte facility. DuPont has agreed to address the proposed CSB recommendations as part of its plan to safely restart the facility.

Among the [investigators' main recommendations](#):

- Perform Inherently Safer Design Review
- Ensure the Manufacturing Building is Safe for Workers
- Provide Relief System Design that is Safe for Workers and the Public
- Complete More Robust Process Hazard Analyses
- Assure Active Workforce Participation
- And Promise Public Accountability and Transparency

A CSB team led by Investigator Dan Tillema spent seven months on-site conducting the investigation and will work to address additional significant process safety issues before the Board issues a final report.

The DuPont La Porte plant was once a leader in applying inherently safer design. It is well known for pro-active changes made to the facility after the devastating December 3, 1984, accident in Bhopal, India. Considered the worst industrial accident in history, thousands of people were killed during a release of methyl isocyanate (MIC) at a Union Carbide insecticide plant. That accident triggered changes throughout the chemical industry, including the DuPont La Porte insecticide unit that also used MIC. Investigator Tillema said, "DuPont made modifications then that incorporated inherently safer design principles for methyl isocyanate, including an open building structure with equipment to direct potential leaks of toxic chemicals to an incinerator. However, DuPont did not take the same steps with other highly toxic chemicals at La Porte such as methyl mercaptan and chlorine, also used to make Lannate®."

The CSB's draft findings and recommendations state that DuPont invested \$20 million in 2011 to increase production and reduce environmental emissions at the insecticide unit by installing an incinerator. But the installation of the incinerator created problems: liquid accumulation and frequent high-pressure events in the vapor waste gas vent header piping. "It just became a normal response for operators to go out there and drain it," Mr. Tillema said.

The CSB found a chain of events that led to the fatal accident, beginning with the November 10 delivery of another Lannate® raw material by tank truck. During the unloading of the tank truck, a water dilution system was inadvertently activated and the raw material's storage tank overflowed, resulting in a shutdown of the insecticide unit. When operators attempted a restart on November 12, a salt-slurry material had blocked a reaction system, a common occurrence following a shutdown.

During actions to clear the salt-slurry blockage, two thousand pounds of water was inadvertently sent to a storage tank containing methyl mercaptan, creating a solid, ice-like material called a hydrate in connecting piping called the methyl mercaptan feed line.

On November 14, a troubleshooting team of managers and engineers developed a plan and instructed operators to apply hot water under the blocked pipes' insulation, warming and breaking up the hydrate. They realized that when heated, methyl mercaptan would expand and would need a safe place to vent, and two valves leading to vent piping were opened. But this plan had not gone under safety review as required by the company's own standards. Moreover, the CSB learned that there were no written procedures to guide operations or to track the success of the plan or

progress toward clearing the entire methyl mercaptan feed line.

At 2:45 a.m., the methyl mercaptan level in the storage tank began dropping as the hydrate liquefied and the toxic chemical flowed toward the open waste gas vent header. As methyl mercaptan began to flow in the vent piping, high pressure alarms for process equipment connected to the vent header registered on computer consoles in the control room. Operators did not realize that the two problems – the hydrate blockage and the high pressure – were related, the investigators said.

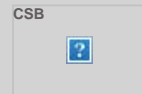
Two operations workers went to drain the waste gas vent header piping and liquid methyl mercaptan escaped into the building, where it readily vaporized, filling the room with a highly toxic gas. Although one of the workers made a distress call, both died, unable to escape the building. Four additional operators responded to the distress call and entered the manufacturing building. Two of them were brothers—they died together on the same floor as the release. The other two operators survived.

The release continued for another hour and a half until the valves were closed. DuPont estimated that approximately 24,000 pounds of toxic methyl mercaptan was released during the November 15 incident.

The CSB is an independent federal agency charged with investigating serious chemical accidents. The agency's board members are appointed by the President and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems. The Board does not issue citations or fines but makes safety recommendations to companies, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA. Please visit our website, www.csb.gov.

For more information, contact Public Affairs Specialist Shauna Lawhorne at public@csb.gov or by telephone: (202) 384-2839.

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